

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1 (Currently Amended) A method of determining, measuring and comparing the oxidative free radical activity activities and scavenging activities in a natural or synthetic substance including the measuring by SIFT-MS technology comprising:

of the oxidative free radical and scavenging activities taking in a gas sample taken from the headspace of an oxidative free radical reaction mixture including the natural or synthetic substance and an appropriate radical generator and a suitable reactive substrate, to be measured, comprising measuring the concentration of ethylene as an assay for antioxidant activity to provide a measurement of the concentration of the analyte to thereby indicate the total activity of an antioxidant and the rate of reaction of the antioxidant with the substrate, the method comprising

producing, mass selecting and accelerating precursor ions into a stream of inert carrier gas, thereby forming an inert carrier gas/ion stream,

injecting a mixture of the gas sample and the analyte into the inert carrier gas/ion stream, allowing the ethylene a trace volatile in the reaction mixture head space gas sample to react with the selected precursor ions thereby forming product ions,

detecting, amplifying and analysing the amount and rate of ethylene the trace volatile produced in the reaction mixture headspace as a measure of the rate and amount of the natural or synthetic substance, said rate and amount being indicative of the oxidative free radical activities and scavenging activities of the natural or synthetic substance introduced analyte antioxidant activity.

2. (Currently amended) The method as claimed in claim 1, wherein the trace elements volatile in the gas sample reacts with the precursor ions in the helium inert carrier gas/ion stream, wherein the trace volatile is ethylene and the inert carrier gas is helium.

3. **(Currently amended)** The method as claimed in claim [[1]] 2, wherein the partial pressure of ethylene in the gas sample is calculated as part of the measurement of the rate and amount of ~~introduced analyte~~ the natural or synthetic substance.

4. **(Currently amended)** The method as claimed in claim 1, wherein the gas sample is introduced into the inert carrier gas/ion stream at a calibrated rate via a heated capillary inlet.

5. **(Currently amended)** The method as claimed in claim 1, wherein the concentration of each ~~gas species of volatile organic compounds~~ trace volatile in the gas ~~mixture~~ sample is calculated from the number densities of the precursor and product ions.

6. **(Currently amended)** The method of claim [[6]] 5, wherein the number densities are measured by a ~~second~~ mass filter in conjunction with a particle multiplier and a software interface.

7. **(New)** The method of claim 1, wherein the reactive substrate is α - keto- γ -methiolbutyric acid.